OIPE JC1580
MAY 12 2004
PATENT & TRADEMARK OFFICE

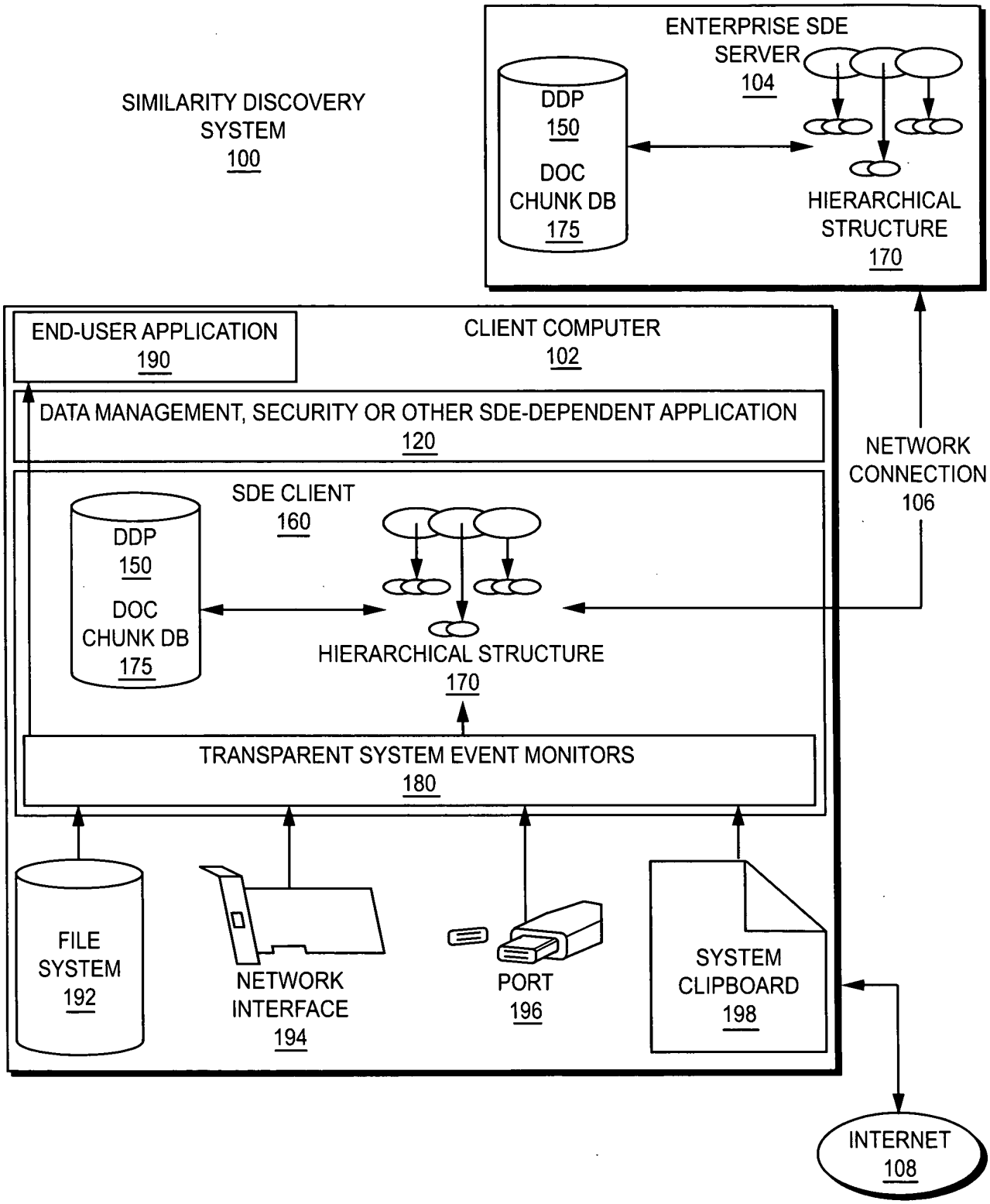

FIG. 1

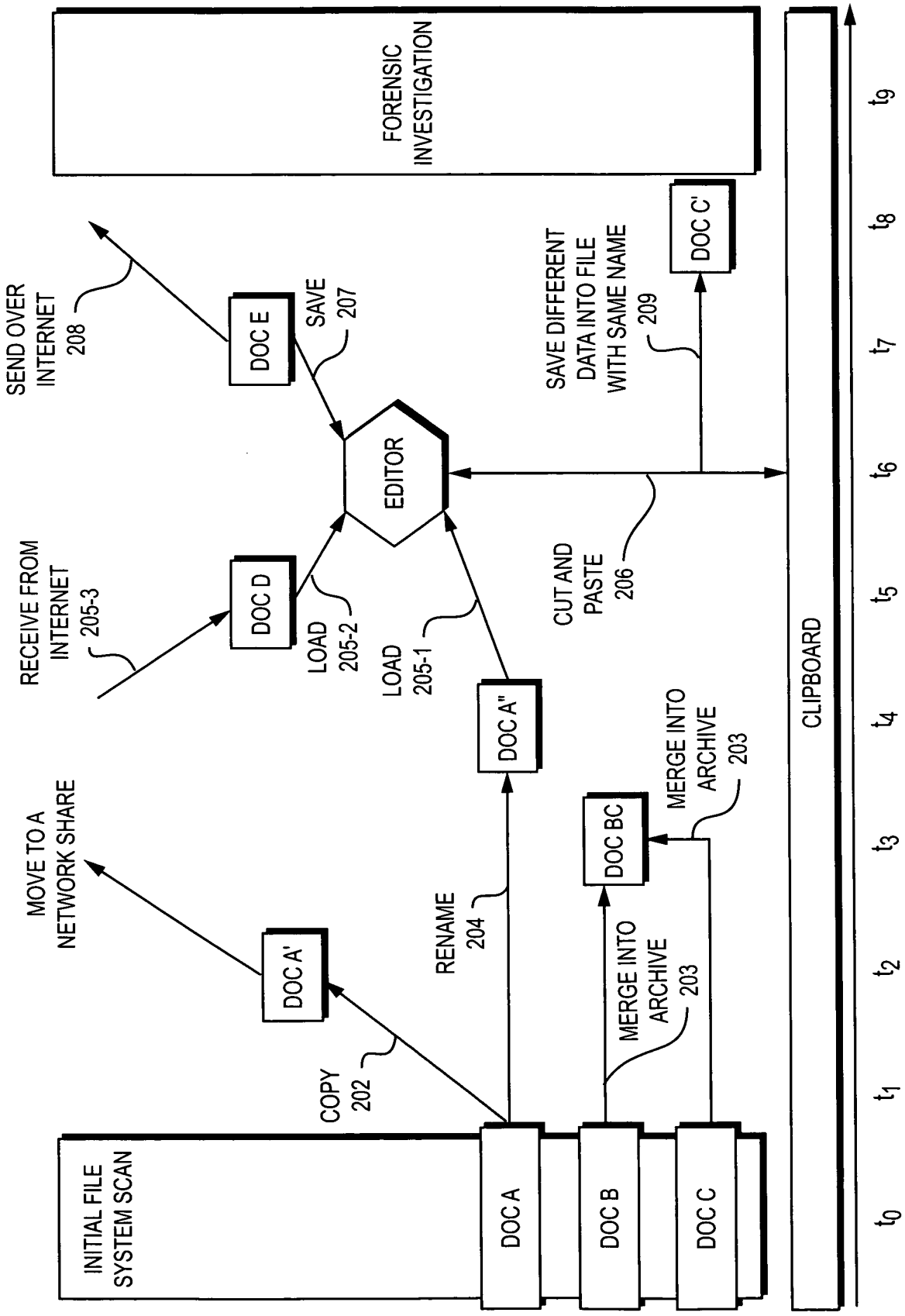
FORENSIC INVESTIGATION
SEND OVER INTERNET 208
DOC E
SAVE 207
EDITOR
SAVE DIFFERENT DATA INTO FILE WITH SAME NAME 209
DOC C'
RECEIVE FROM INTERNET 205-3
DOC D
LOAD 205-2
LOAD 205-1
CUT AND PASTE 206
DOC A"
MOVE TO A NETWORK SHARE
DOC A'
RENAME 204
DOC BC
MERGE INTO ARCHIVE 203
MERGE INTO ARCHIVE 203
CLIPBOARD
COPY 202
INITIAL FILE SYSTEM SCAN
DOC A
DOC B
DOC C
t_0
t_1
t_2
t_3
t_4
t_5
t_6
t_7
t_8
t_9
TIME

FIG. 2

DDP 150

FILED ID FROM	FILE ID TO	OPERATION	
A'	C'	INITIALLY SIMILAR	301
A	A'	COPY	302
A	A"	RENAME	304
• • •	• • •	• • •	
A"	E	EDIT	306
D	E	EDIT	307
E	ϕ	EMAIL	308
• • •	• • •	• • •	

FIG. 3

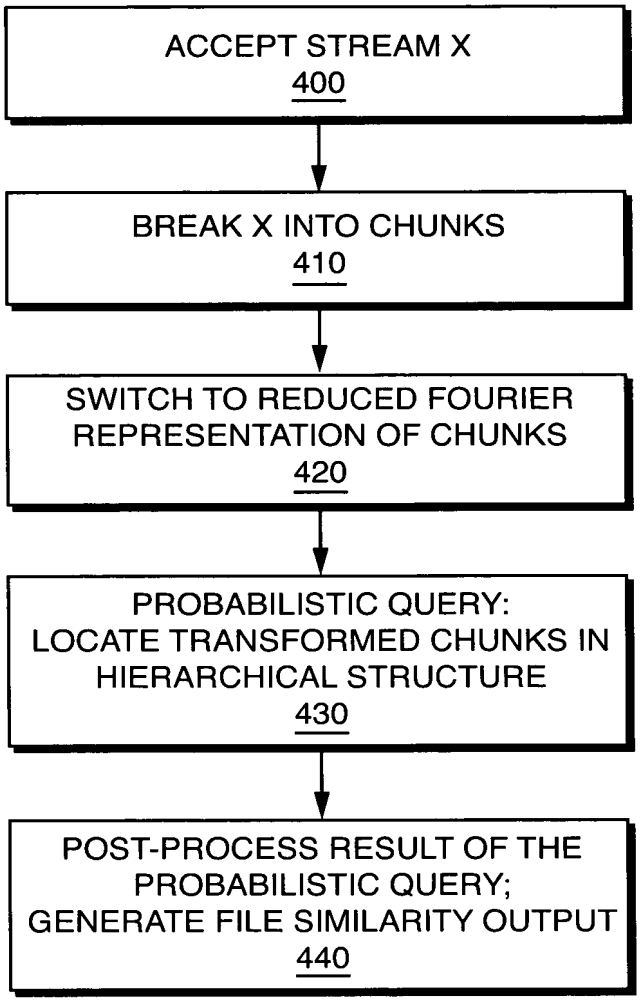
ACCEPT STREAM X
400
BREAK X INTO CHUNKS
410
SWITCH TO REDUCED FOURIER REPRESENTATION OF CHUNKS
420
PROBABILISTIC QUERY: LOCATE TRANSFORMED CHUNKS IN HIERARCHICAL STRUCTURE
430
POST-PROCESS RESULT OF THE PROBABILISTIC QUERY; GENERATE FILE SIMILARITY OUTPUT
440

FIG. 4

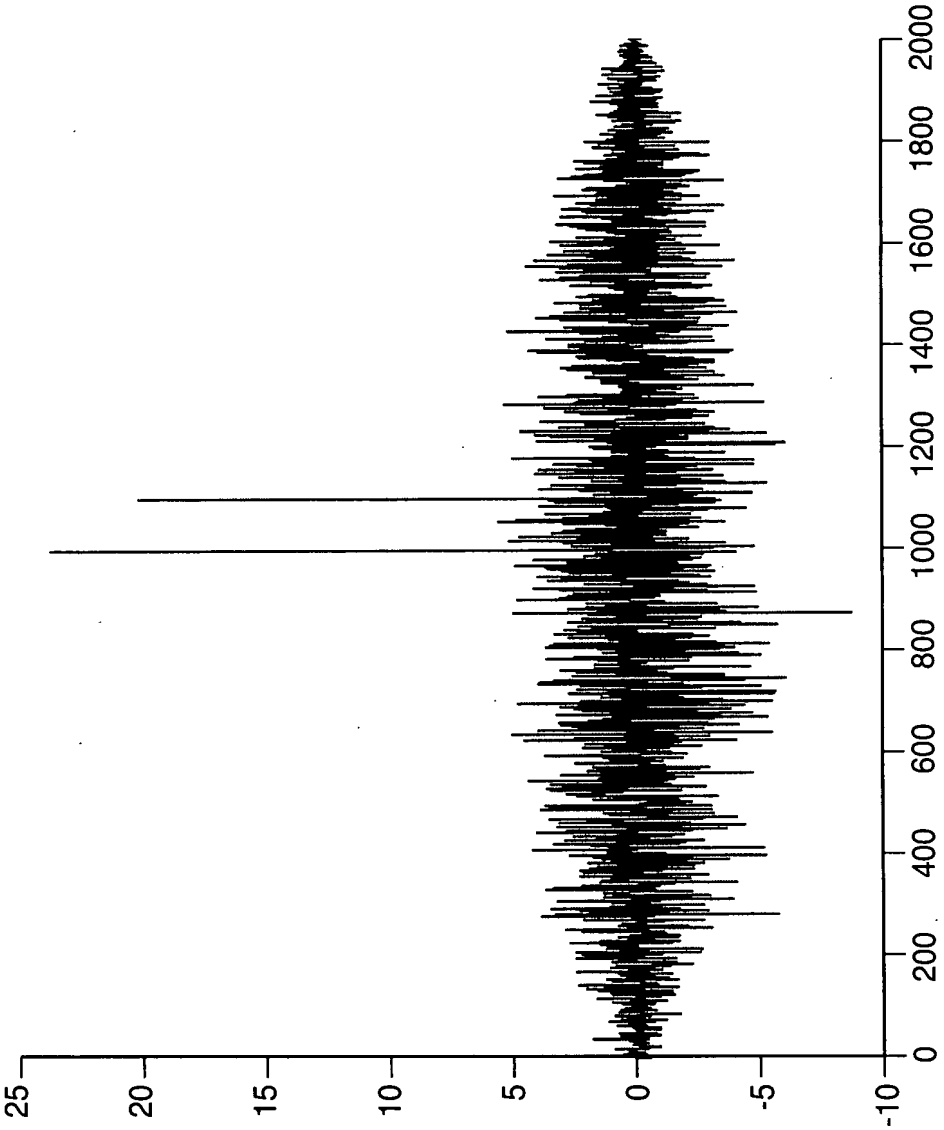
25
20
15
10
5
0
-5
-10
0
200
400
600
800
1000
1200
1400
1600
1800
2000

FIG. 5

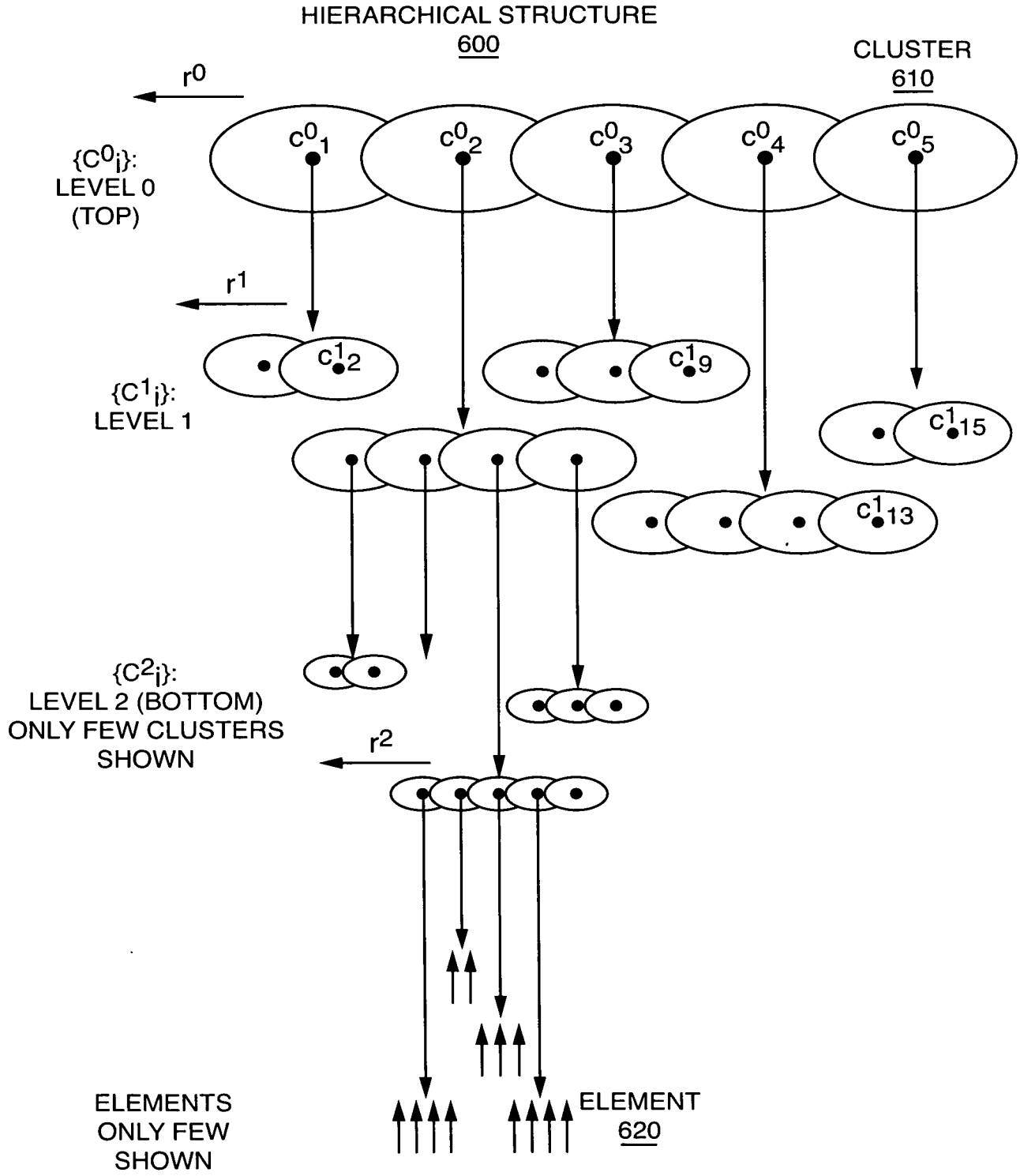
HIERARCHICAL STRUCTURE
600
CLUSTER
610
r0
{C0i}:
LEVEL 0
(TOP)
c0 1
c0 2
c0 3
c0 4
c0 5
r1
{C1i}:
LEVEL 1
c1 2
c1 9
c1 15
c1 13
{C2i}:
LEVEL 2 (BOTTOM)
ONLY FEW CLUSTERS
SHOWN
r2
ELEMENTS
ONLY FEW
SHOWN
ELEMENT
620

FIG. 6

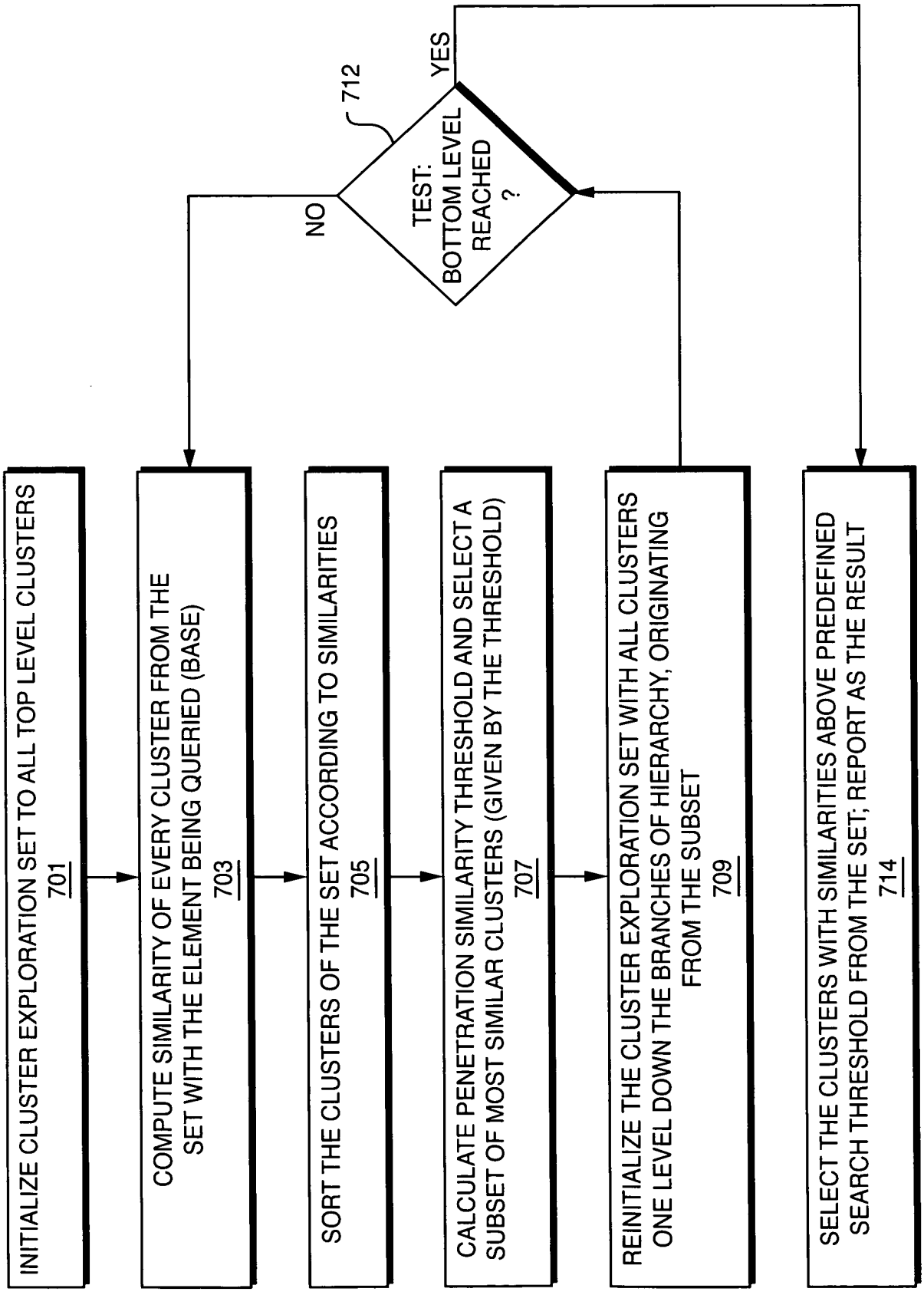
INITIALIZE CLUSTER EXPLORATION SET TO ALL TOP LEVEL CLUSTERS
701
COMPUTE SIMILARITY OF EVERY CLUSTER FROM THE SET WITH THE ELEMENT BEING QUERIED (BASE)
703
SORT THE CLUSTERS OF THE SET ACCORDING TO SIMILARITIES
705
CALCULATE PENETRATION SIMILARITY THRESHOLD AND SELECT A SUBSET OF MOST SIMILAR CLUSTERS (GIVEN BY THE THRESHOLD)
707
REINITIALIZE THE CLUSTER EXPLORATION SET WITH ALL CLUSTERS ONE LEVEL DOWN THE BRANCHES OF HIERARCHY, ORIGINATING FROM THE SUBSET
709
SELECT THE CLUSTERS WITH SIMILARITIES ABOVE PREDEFINED SEARCH THRESHOLD FROM THE SET; REPORT AS THE RESULT
714
712
TEST: BOTTOM LEVEL REACHED ?
NO
YES

FIG. 7